

APPLICANT: Roman VITENBERG
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AMENDMENTS TO THE SPECIFICATION

In the Specification:

✓
Kindly replace the paragraph on Page 1 that begins with the words "Digital Subscriber Line", with the following paragraph:

A1
--Digital Subscriber Line is a new communication technology that allows existing twisted pair Cable Telephone Network to be converted into a high-performance Multimedia Digital Network for multimedia and high-speed data communications with the ability to provide to every subscriber high speed data communication that includes many new services as Video-on-demand, Conference VideoPhone, HDTV Broadcast, Digital Hi Fi Audio, Fast Internet and others.--

✓
Kindly replace the paragraph on Page 1 that begins with the words "These international standards", with the following paragraph:

A2
--These international standards define the frequency bands permitted for downstream (in the direction from a Central Office (CO) of a communication service ~~provided to a~~ home modem) or of upstream (in the direction from the home modem to the CO) transmission for different DSL systems. As a result, different DSL systems may operate function properly on the different twisted pairs of the same telephone cable--

✓
Kindly replace the paragraph on Page 2 that begins with the words "Fig. 1 illustrates", with the following paragraph:

A3
-- Fig. 1 illustrates the frequency band allocation plan for the DSL system in accordance with ITU regulation. A "Plain Old Telephone Service" (POTS) occupies voice frequency band 101 up to a frequency of 4 kHz. An Asymmetric Digital Subscriber Line

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A3
(ADSL) uses digital multitone (DMT) line signals for communication between subscriber equipment and the central office (CO) of the telephone station. ~~An ADSL Equipment~~ equipment of the CO transmits downstream data by modulation of about 200 tones in frequency band 105 from 200 kHz to 1100 kHz and receives about 30 tones of upstream data in frequency band 103 from 28 kHz to 140 kHz. ADSL systems are able to transmit downstream data with ~~speed~~ speeds up to 10 Mb/s and upstream data with ~~speed~~ speeds of up to 1 Mb/s. ADSL ~~was~~ specially developed for long cable lines with length of up to 4.5 km.--

Kindly replace the paragraph on Page 2 that begins with the words "In VDSL", with the following paragraph:

A4
-- In VDSL, ~~system~~ data may be transmitted with a much higher bit rate: downstream data up to 56 Mb/s and upstream data up to 26 Mb/s but works only on short cable ~~line~~ lines of up to 1.5 km.--

✓
Kindly replace the paragraph on Page 2 that begins with the words "The most wide-spread ADSL use", with the following paragraph:

A5
-- The most wide-spread ADSL use is in point-to-point connected ~~circuit~~ circuits. Such a system includes an ADSL modem on each end of the twisted pair telephone line, creating three information channels – a high speed downstream (central office to end user) channel, a medium speed upstream (end user to central office) channel, and a POTS ("Plain Old Telephone Service") channel. The POTS channel is separated from the ADSL modem by filters, thus guaranteeing uninterrupted POTS, even if the ADSL circuit fails.--

✓
Kindly replace the paragraph that begins on Page 2 and that continues on Page 3, that begins with the words " Two variants of ADSL systems--...", with the following paragraph:

A6
--Two variants of ADSL systems are available today: full-rate ADSL in accordance with the T1E1.413 or ~~ITG~~ ITU G.992.1 standards and "splitterless" ADSL in accordance with

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the ITU G.992.2 standard. Full-rate ADSL uses POTS splitters to separate the POTS channel from the ADSL data signals. A POTS splitter is installed at each end of the line and includes a low-pass filter for separating out POTS telephone voice communication signals and a high-pass filter for separating out data communication signals.--

Kindly replace the paragraph on Page 3 that begins with the words "Splitterless ADSL can be installed...", with the following paragraph:

--Splitterless ADSL can be installed without the need for additional home wiring. In this case, the ADSL modem includes a high-pass filter that rejects the POTS telephone voice communication signal, while every telephone instrument in the house is connected to the telephone line through a low-pass microfilter that rejects the ADSL data signals. A splitterless ADSL system is advantageous in that it is a ~~"Play and Plug"~~ "Plug and Play" system. A customer does not need any special service from his telephone company to install the ADSL home equipment. What is needed therefore is an ADSL home modem and a number of microfilters (according to the number of telephones in the house) and to plug those devices into existing telephone connectors. Given the ease of connection, several PC (personal computer) manufacturers include splitterless ADSL modems (G.LITE modems) within the PCs motherboards and also supply the several microfilters with the PC.--

Kindly replace the paragraph that begins on Page 3 and that continues on Page 4, that begins with the words "Fig. 2 is a block ...", with the following paragraph:

--Fig. 2 is a block diagram illustrating a prior art splitterless ADSL system generally designated 201. A number of subscriber premises 203 are coupled to a central office (CO) 209 by a telephone cable 217 comprising a plurality of twisted pair subscriber telephone lines 207. At the subscriber ~~premise~~ premises 203 there are customer premises equipment including personal computers (PC) 225 (two in this specific example), a printer 227, a fax 221 and telephone devices 223. One PC 225 is connected to another PC 225 and to printer 227 by

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A8 Cont.
parallel port cables 229 constituting together a digital home network. ~~A ADSL~~ An ADSL modem is connected directly to telephone line 207 and by an Ethernet cable 224 to one of the PCs 225. Fax 221 and telephone device 223 are connected to telephone line 207 by microfilters 219. CO 209 includes ~~an~~ ADSL Office Equipment 211, a data switch 235, linked to a data network 215 and a voice switch 237 linked to a voice network 213. Each twisted pair subscriber telephone line 207 is coupled to a POTS splitter 231, which is coupled to the voice switch 237 and to an ADSL office modem 233. --

Kindly replace the paragraph on Page 4 that begins with the words "Voice communications ...", with the following paragraph:

A9
--Voice communications passing through voice switch 237 are passed through POTS splitter 231 and applied to twisted pair 207 as baseband signals. Data communications passing through data switch 235 are modulated at a frequency range higher than that of the baseband POTS signals, and passed through POTS splitter 231 and applied to twisted pair 207. Since the data communications are transmitted at a different frequency range than the voice communications, frequency-division multiplexing (FDM) allows simultaneous transmission of both voice communications (POTS) and data communications over a single twisted pair 207.--

Kindly replace the paragraph on Page 4 that begins with the words "A standard ADSL system...", with the following paragraph:

A10
--A standard ADSL system has some shortcomings. For one, an ADSL system needs to be always connected. It means that the ADSL modem continuously transmits and receives DMT signals regardless whether information is transmitted or not. As a result, a plurality of ADSL modems 233 of the Central Office work continuously and consume extensive energy. Additionally, at the other end, only one ADSL home modem may be connected to the telephone line in the home because frequency bands of upstream and downstream are always busy. In the USA, this has become a problem as about 20 million subscribers have more than

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A10 Cont.
one PC inside the home. ~~In case of~~ When two or more PCs in the home have internal ADSL ~~modem~~ modems, only one of them may be physically connected to the telephone line. Every time a customer wants ~~an~~ to access ~~to~~ the Internet from another PC, he must connect this PC to the telephone line and disconnect other PCs.--

Kindly replace the paragraph that begins on Page 4 and that continues on Page 5, that begins with the words "Another problem is...", with the following paragraph:

All
--Another problem is that existing splitterless ADSL systems do not support communication between several computers within the home. It means that a subscriber must have an additional home data network like Ethernet and additional network equipment inside their PCs. A further problem resides in that existing ADSL home modems may not support future VDSL systems. A VDSL system is expected to become widespread over the coming years. ~~Telecommunications~~ Telecommunications companies are expected to replace existing ADSL Central Office equipment with new VDSL equipment, which will be able to support a much higher data bit rate.--

Kindly replace the paragraph on Page 5 that begins with the words "The present invention..." , with the following paragraph:

A12
--The present invention is directed to a system and modems for multipoint communication in a splitterless asymmetric digital subscriber line (ADSL) system. The system of the present invention includes at least one subscriber ~~premise~~ premises ("SP") and a central office of a telephone communication provider (to be referred to herein as "Central Office" or "CO"). The home may be a home residence, a small office, etc. In the system of the invention, the subscriber ~~premise~~ premises and the Central Office are connected by a twisted pair subscriber telephone line. The subscriber ~~premise~~ premises in accordance with the invention, comprises a plurality (two or more) of NDSL (network DSL) modems. Each NDSL modem within the subscriber ~~premise~~ premises may be directly connected to the same home telephone line and may communicate with any other home NDSL modem, in the same ~~premise~~,

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A12
Cont.
premises or with the office xDSL (ADSL or VDSL) modem. In accordance with the present invention, the multipoint NDSL system provides not only data and voice service to and from said ~~premise premises~~, but also network data communication within the ~~premise premises~~. —

Kindly replace the paragraph that begins on Page 5 and that continues on Page 6, that begins with the words "a central office (CO)...", with the following paragraph:

A13
- --a central office (CO) of a communication service provider and at least one subscriber ~~premise~~ premises (SP), each SP being linked to a CO by a subscriber-associated communication line comprising a twisted pair telephone line; --

Kindly replace the first paragraph on Page 6 that begins with the words "a plurality of ...", with the following paragraph:

A14
- -- a plurality of communication devices in each SP, said devices comprising one or more telephone devices connected to the communication line and at least one network DSL (NDSL) modem associated with a computerized device, the NDSL modem being connected to said communication line; each of said modems having an upstream transmitter and a downstream receiver for communication with the CO and an upstream ~~of~~ transmitter and an upstream receiver for communication with other NDSL modems within the SP.--

Kindly replace the paragraph on Page 6 that begins with the words "The computerized devices ..." , with the following paragraph:

A15
--The computerized devices associated with the NDSL modem may be selected from a variety of such devices which can transmit or receive digital data. These include computers, particularly personal computers, as well as other devices which can receive, transmit or store digital data or respond to such data including: a video recorder; a home television, e.g. a high definition television (HDTV); and a variety of home appliances, which can respond to digital command packets such as electronic locks, ~~eloseness~~ door closures with an electronic control

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A15
Cont

module, a cooker with an electronic control module and others. The NDSL modem may be an independent device coupled to the computerized device, or may be integral therewith. --

Kindly replace the paragraph on Page 6 that begins with the words "The NDSL modem comprises ...", with the following paragraph:

A16

--The NDSL modem also comprises ~~also~~ a means for transmitting a control signal to which the CO modem is not receptive and which signals at least one other NDSL modem to be ready to receive data packets. Such a ~~controlled~~ control signal is typically at a frequency not used for communication between the NDSL modem and the CO modem, e.g a DMT signal. --

Kindly replace the paragraph that begins on Page 6 and that continues on Page 7, that begins with the words "a plurality of communication devices...", with the following paragraph:

A17

--a plurality of communication devices comprising one or more telephone devices connected to the communication line and at least one network DSL (NDSL) modem associated with the NDSL modem being connected to said communication line; each of said modems having an upstream transmitter and a downstream receiver for communication with the CO and an upstream ~~of~~ transmitter and an upstream receiver for communication with other NDSL modems within the SP.--

Kindly replace the paragraph on Page 7 that begins with the words "an upstream transmitter ...", with the following paragraph:

A18

-- an upstream transmitter and a downstream receiver for communication with an xDSL modem placed at a central office (CO) of a communication service provider through a twisted pair telephone line linking the NDSL modem and the xDSL CO modem, and

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comprising an upstream transmitter and an upstream receiver for communication with other NDSL modems included within the same subscriber-premise premises.--

✓
Kindly replace the paragraph on Page 7 that begins with the words "In accordance with one embodiment ...", with the following paragraph:

A19
--In accordance with one embodiment of the invention, the communication between the NDSL modem and the office ADSL modem is realized by the application of the ADSL communication standard – FDM (~~frequency-devising~~ division- multiplex) duplex protocol, during short communication cycles (communication cycles initiated by a computer in the SP prompting the NDSL modem to connect to an Internet service provider or to any other computer network (ISP)). An NDSL modem may then connect to the telephone line and ~~activates~~ activate a standard ADSL communication protocol (e.g. in accordance with ITU G.992.2) to establish communication with the CO ADSL modem. Upon downloading of requested data, e.g. an Internet page, the NDSL modem disables the ADSL office modem and disconnects from the telephone line. The ITU ~~G.992.2~~ G.992.2 standard provides for several special commands for disabling the CO modem, which may be employed by the NDSL modem to assume communication, without any change in existing CO ADSL equipment. --

✓
Kindly replace the paragraph on Page 8 that begins with the words "In accordance with another embodiment...", with the following paragraph:

A20
--In accordance with another embodiment of the invention, ADSL upstream band 103 and VDSL upstream bands 111, 113 are employed for data communication in a half-duplex mode within the SP network. In accordance with this embodiment of the invention, an NDSL modem comprises a universal ADSL/VDSL transmitter, which may transmit DMT line signals in the ADSL upstream frequency band 103, as well as in VDSL frequency bands 111, 113. The NDSL modem of this embodiment comprises also an additional VDSL upstream receiver. The universal ADSL/VDSL transmitter and the additional VDSL downstream

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A20
Cont receiver, may be used also for communication with a VDSL CO modem, replacing the standard CO ADSL modems. Thus, in accordance with this embodiment, the SP equipment is ~~this~~ "VDSL-ready", namely it is ready for future expected ~~upgrade~~ upgrades of Central Office equipment from current ADSL modems to VDSL modems.--

Kindly replace the paragraph that begins on Page 8 and that continues on Page 9, that begins with the words "In accordance with yet another ...", with the following paragraph:

A21 --In accordance with yet another embodiment of the invention, the SP comprises one or more N.LITE modems which may communicate through the home networks with other modems using the ADSL upstream frequency band. N.LITE modems may be used for a connection to home data network devices such as a printer, scanner and others, which do not need to directly link to the CO.--

Kindly replace the paragraph on Page 9 that begins with the words "Fig 1. ...", with the following paragraph:

A22 --~~Fig. 1~~ illustrates frequency ~~bands~~ band allocation for xDSL systems. --

Kindly replace the paragraph on Page 9 that begins with the words "Fig 2. ...", with the following paragraph:

A23 --~~Fig 2~~ is a block diagram illustrating a prior art splitterless ADSL system.--

Kindly replace the paragraph on Page 10 that begins with the words "The present invention ..." ;with the following paragraph:

A24 --The present invention concerns systems and devices for a multipoint communication in an ADSL system. The communication technique of the invention allows a subscriber to

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A24
Cont

have multipoint data and voice service with a central office of a telephone service provider, as well as data communication within the SP network, using a number of NDSL modems. In accordance with the present invention, some disadvantages and ~~shortcoming~~ shortcomings associated with the need for a continuous connection operation mode in prior art ADSL systems, have been substantially reduced. --

Kindly replace the paragraph on Page 10 that begins with the words "In one embodiment..." , with the following paragraph:

A25

--In one embodiment of a multipoint NDSL system in accordance with the present invention, a number of NDSL modems in the SP are provided, each of which comprises an ADSL upstream transmitter and an ADSL downstream receiver ~~from~~ for communication with an ADSL CO modem, as well as an ADSL upstream receiver and a TDM control tone receiver for data communication within the SP network. An active NDSL modem transmits a TDM control tone informing other modems in the SP that the line is busy. The control tone carries information about which of the modems is active and which is to receive data in a current communication cycle. Each modem analyzes the control tone information and, in case of a match between the received information and the I.D. number of the modem, the modem enables its ADSL upstream receiver. The control tone is at a frequency that is not used for communication with the CO and to which the ADSL CO modem is not receptive and is thus not activated thereby. After termination of data transmission, an active ADSL modem disables its upstream transmitter, stops control tone transmission and switches into a stand-by state. --

Kindly replace the first paragraph on Page 11 that begins with the words "In accordance with another embodiment..." , with the following paragraph:

A26

--In accordance with another embodiment of the invention, each NDSL modem within the SP further comprises a universal ADSL/VDSL upstream transmitter and VDSL upstream receiver for high speed home data network communication. --

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Kindly replace the paragraph that begins on Page 11 and that continues on Page 12, that begins with the words "Reference is first being made...", with the following paragraph:

A21
--Reference is first ~~being~~ made to Fig. 3 illustrating one embodiment of a multipoint NDSL system 301. A number of subscriber premises 203 are each coupled to a CO 209 by a telephone cable 217 comprising a plurality of twisted pair subscriber telephone lines 207. At each such subscriber ~~premise~~ premises 203, which may be a residence, a small office, etc., there are ~~premise~~ premises equipments ~~equipment~~ including, for example, personal computers (PCs) 225 (two in this specific example), a printer 227, a facsimile machine 221 and telephone devices 223. One of the PCs 225 is connected to printer 227 by a parallel port cable 229. NDSL modems 305 are connected directly to the telephone line 207 and each is connected through an Ethernet cable 224 to one of the PCs 225. Fax 221 and telephone devices 223 are connected to the telephone line 207 through a microfilter 219. CO 209 includes an ADSL office equipment 211, a data switch 235 linked to a data network 215, and a voice switch 237 linked to voice network 213. Each twisted pair subscriber telephone ~~lines~~ line 207 is coupled to a POTS splitter 231, which is coupled to the voice switch 237 and to an ADSL office modem 233/--

Kindly replace the paragraph on Page 12 that begins with the words "Each NDSL modem ...", with the following paragraph:

A22
--Each NDSL modem 305 may communicate both with the ADSL office modem 233 as well as with other home NDSL modems 305 included within the same ~~premise~~ premises. When communicating with CO 209, NDSL modem 305 transmits upstream data with a bit rate up to 1 Mb/s and receives downstream data with a bit rate up to 10 Mb/s. An NDSL modem 305 may analyze line signals and communication protocols in accordance with existing ADSL standards (T1E1.413 or ITU G.992.1).--

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Kindly replace the paragraph on Page 12 that begins with the words "During data transmission...", with the following paragraph:

A29
--During data transmission with the CO, downstream data is transmitted within the ADSL downstream frequency band **105**, and upstream data ~~is transmits~~ transmitted inside the ADSL upstream frequency band **103**. During periods of no data transmission between the CO and any of the NDSL modems, ADSL upstream frequency band **103** may be used for network communications within the SP. --

Kindly replace the paragraph on Page 12 that begins with the words "The data network ..." , with the following paragraph:

A30
-- The data network communication between PCs **225** may utilize the half-duplex protocol, with data packages being transmissible in two directions, with time division multiplexing ~~(DTM)~~ (TDM). Typically only ADSL upstream frequency band **103** is used with a bit rate of up to 1.5 Mb/s. The NDSL modem **305** may make use of the same DMT line signals and different synchronization signals as in the hitherto existing ADSL standard. --

Kindly replace the paragraph that begins on Page 12 and that continues on Page 13, that begins with the words "Reference is now being made...", with the following paragraph:

A31
--Reference is now ~~being~~ made to Fig. 4, showing a block diagram of an ADSM NDSL modem **305** in accordance with an embodiment of the invention. Modem **305** comprises an ADSL upstream receiver **403**, an ADSL downstream receiver **405**, an ADSL upstream ~~receiver~~ transmitter **407**, a data interface circuit **409**, a communication processor **411**, a control tone receiver **413**, a high impedance amplifier **415**, a line transformer **417** and a control tone transformer **419**. A primary winding of the line transformer **417** is coupled to the subscriber telephone line **207** ~~from~~ via a high pass filter capacitor **423** into a primary winding of control tone transformer **419**. A secondary winding of the line transformer **417** is coupled to the input of an ADSL upstream receiver **403**, to an input of the ADSL downstream receiver

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A31 Cont
405 ~~into~~ and to an output of the ADSL upstream transmitter 407. A secondary winding of the control tone transformer 419 is coupled to the input of the high impedance amplifier 415, the output of which is connected to the input of the TDM control tone receiver 413. An input of the ADSL upstream transmitter 407, an output of the ADSL upstream receiver 403 and an output of the ADSL downstream receiver 405, are connected to the data interface circuit 409, by means of digital buses 429, 425, and 427 ~~and 429~~ respectively. Data interface circuit 409 is coupled to the SP equipment by an Ethernet cable 224. A communication processor 411 is coupled to the ADSL upstream receiver 403, to ADSL downstream receiver 405, to ADSL upstream transmitter 407, to control tone receiver 413 and to switch 433 that is connected in parallel to the primary winding of control tone transformer 419. --

Kindly replace the paragraph that begins on Page 13 and that continues on Page 14, that begins with the words "Reference is now being made to Fig. 5...", with the following paragraph:

A32
--Reference is now ~~being~~ made to Fig. 5 showing a flow chart of operation of the NDSL modem 305. At the start of operation 501, the NDSL modem goes into a standby state 503. In this stage, switch 433 is open and the end NDSL modem 305 has a high input impedance inflicted by the high impedance amplifier 415 and low frequency control tone transformer 419. This allows ~~to link~~ a plurality of NDSL modems to be linked to the same subscriber telephone line 207. In this stage ADSL upstream transmitter 407, ADSL upstream receiver 403 and ADSL downstream receiver 405 are disabled. Against this, control tone receiver 413 is enabled, permitting communication processor 411 to analyze the output signal of control tone receiver 413 as well as signals from digital interface circuit 409. From the standby state 403, the NDSL modem enters into state 505 and in this state the output signal of control tone receiver 413 is analyzed. If a control tone is received, NDSL modem enters ~~to~~ state 507; if not, it enters ~~to~~ state 509. In state 507, a communication processor 411 analyzes information carried by the control tone and enters state 511 to analyze the received data. If communication processor 411 establishes a match between the received data and its own I.D.,

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A33
Cont

NDSL modem enters state 513 in which it may communicate with another home NDSL modem; if not, the modem switches back to a standby state 503. In state 513, which is the first communication state, the ADSL upstream receiver 403 is enabled, permitting communication in a half-duplex protocol 515 and subsequently turning on ADSL upstream transmitter 517. At the next state 519, a transmission-receiving mode between two NDSL modems is enabled, permitting receipt and transmission of data packets. After ~~transmission~~ transmitting or receiving all data packets, the NDSL modem communicates to establish whether a communication cycle has ended or not (state 521); if not, the NDSL modem continues to transmit or receive additional data packets. If the communication cycle ends, the NDSL modem disables the upstream receiver and the upstream transmitter, and stops transmission of control tone (state 523) to inform other devices that the telephone line is now not busy. At a subsequent state 525, the NDSL modem is disconnected from the line and enters into a standby state 503.--

Kindly replace the paragraph on Page 12 that begins with the words "If in state..." , with the following paragraph:

A33

--If in state 505 the control tone is not received, the NDSL modem enters state 509. If a PC is asking for communication, the NDSL modem enters state 531; if not - the modem goes back to standby state 503. In state 531, the NDSL modem is connected to the telephone line, with upstream transmission being enabled, and then enters state 533 in which control tone transmission is initiated to inform any other device that the line is busy. In a subsequent state 535, the nature of communication needed by the PC is defined. In the case of communication with another NDSL modem 537, information about the I.D. number of the modem is transmitted (state 539), and then NDSL modem enters state 513 to enable ADSL upstream receiver. In the case of communication with CO 545 209 (YES?), the standard ADSL duplex protocol may be used and the modem may operate in an FDM mode. Otherwise, the modem enters state 547 in which it asks the PC whether the communication cycle has ended. If the

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A33
communication cycle has ended, the modem switches to state 523. If not, it switches to ADSL transmission/receiving state 545.--

✓
Kindly replace the paragraph on Page 15 that begins with the words "Reference is now being made..." , with the following paragraph:

A34
-- Reference is now ~~being~~ made to Fig. 6 illustrating another embodiment of a multipoint NDSL system 601. A number of subscriber premises 203 are connected to the CO 209 through a telephone cable 217 comprising a plurality of twisted pairs of subscriber telephone lines 207, ~~similarly similar as in to~~ the embodiment shown in Fig. 3. A subscriber ~~premise~~ premises 203 comprises a communication equipment similar to those shown in Fig. 3 and further video ~~equipments~~ equipment consisting of a video recorder 653, ~~and a~~ an HDTV television 665 and a DVD player 651. Each of these video devices is coupled to a high speed NDSL modem 605 by a digital cable 324. Each of modems 605 is directly connected to telephone line 207. CO 209 is similar to that shown in Fig. 3. --

✓
Kindly replace the paragraph on Page 15 that begins with the words "Each of a high speed ..." , with the following paragraph:

A35
--Each of a high speed NDSL modems 605 can communicate with the ADSL office modem 233 as well as with other high speed NDSL ~~modem~~ modems 605 ~~of and~~ with NDSL modems 305. For communication with CO 209, modems 305 and 605 may transmit upstream data with a bit rate up to 1 Mb/s and receive downstream data with a bit rate up to 10 Mb/s.--

✓
Kindly replace the paragraph on Page 15 that begins with the words "The high speed NDSL modem ..." , with the following paragraph:

A36
--The high speed NDSL modem 605 comprises a universal ADSL/VDSL upstream transmitter and a ADSL downstream receiver for communication with the ADSL office

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AB
modem, and an ADSL upstream receiver, a VDSL upstream receiver and a control tone receiver for home data network communication. The universal ADSL/VDSL transmitter can transmit DTM ~~signal~~ signals only in the ADSL upstream frequency band 103 for communication with the ADSL office modem, as well as in the VDSL upstream frequency bands 111 and 113 for communication with other high ~~reference~~-speed NDSL modems within the subscriber's ~~premise~~ premises. --

Kindly replace the paragraph that begins on Page 15 and that continues on Page 16, that begins with the words " A block diagram of a high speed...", with the following paragraph:

A37
-- A block diagram of a high speed NDSL modem 605 in accordance with an embodiment of the present invention is shown in Fig. 7. Like components to those of the NDSL modem 305 shown in Fig. 4 ~~were~~ have been given like reference numerals and the reader is referred to the description of Fig. 4 for an explanation of their nature and function. The main difference between modem 605 and 305 lies in the inclusion of VDSL upstream receiver 451 and in the inclusion of an ADSL/VDSL upstream transmitter 477 instead of transmitter 407 in modem 305. The principles of operation of this modem are similar to those of modem 305, *mutatis mutandis*. --

Kindly replace the paragraph on Page 16 that begins with the words "Reference is now being made..." , with the following paragraph:

A38
--Reference is now ~~being made~~ to Fig. 8 showing a system 801 in accordance with another embodiment of the invention. Here again, like components to those of previous figures have been given like reference numerals and the reader is referred to the description ~~below~~ above for an explanation of their nature and function. In this embodiment, the subscriber ~~premise~~ premises 203 comprises VDSL-ready NDSL modems 805. Modem 805 permits communication with the standard ADSL office equipment 211 as well as with VDSL office

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A38
equipment 811, which may replace the ADSL office equipment 211 in the future. Furthermore, ~~similarly~~ similar to ~~as in~~ the case of modems 305 and 605, modem 801 also permits communication with other NDSL modems 805, as well as with modems 605 or 305 within the subscriber's ~~premise~~ premises. Modem 805 may use line signals and communication protocols in accordance with existing ADSL standards (T1E1.413 or ITU G.992.1). Communication with a CO ADSL equipment 211, may be similar to the case of modems 305 or 605. In case of communication with a VDSL office equipment 811, modem 805 may transmit upstream data with a bit rate of up to 28 Mb/s and may receive downstream data with a bit rate of up to 50 Mb/s. When communicating in the VDSL mode, modem 805 may use line signals in communication protocols of existing VDSL standards. --

✓
Kindly replace the paragraph on Page 16 that begins with the words "For data communication ...", with the following paragraph:

A39
-- For data communication within the SP, modem 805 may utilize the half-duplex protocol in both ADSL upstream frequency band 103, as well as in VDSL upstream frequency bands 111 and 113. ~~Inter-premise~~ Inter-premises data exchange may have a bit rate of up to 12 Mb/s (when communicating only in the first VDSL upstream band) or of up to 28 Mb/s (when utilizing both bands 111 and 113). The ~~DTM~~ DMT line signals utilized by modem 805 may be transmitted both in the ADSL and VDSL upstream bands. --

✓
Kindly replace the paragraph that begins on Page 16 and that continues on Page 17, that begins with the words "A VDSL-ready NDSL...", with the following paragraph:

A40
--A VDSL-ready NDSL modem 805 comprises a universal ADSL/VDSL upstream transmitter and an ADSL downstream receiver for communication with an ADSL office modem, a VDSL downstream receiver for communication with a VDSL office modem, and a an ADSL upstream receiver, a VDSL upstream receiver and a control tone receiver for home data network communication. A universal ADSL/VDSL upstream transmitter is able to

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transmit ~~DTM~~ DMT signals in the ADSL upstream frequency band **103** for communication with the ADSL office modem, in the VDSL upstream bands **111** and **113** for communication with a VDSL office modem, and in both the ADSL and VDSL upstream frequency bands **103**, **111** and **113** for communication with other VDSL-ready NDSL modems. --

Kindly replace the paragraph on Page 17 that begins with the words "A block diagram of a ...", with the following paragraph:

A41
--A block diagram of a VDSL-ready NDSL modem **805** is shown in Fig. 9. Like components to those of modems **305** and **605** shown in Figs. 4 and 6 ~~having~~ have like reference numerals. This modem is similar to modem ~~405~~ 805 with the main difference being the addition of the VDSL downstream receiver **453**. Otherwise, its structure and mode of operation are similar to those of modem **605** and in this connection the reader is referred to the description ~~below~~ above. --

Kindly replace the paragraph on Page 17 that begins with the words "A multipoint NDSL system ...", with the following paragraph:

A42
--A multipoint NDSL system **1001** in accordance with another embodiment of the invention can be seen in Fig. 10. A subscriber ~~premise~~, premises, in accordance with this embodiment, comprises ~~an~~ N.LITE modems **1005**, each of which is connected directly to a telephone line **207**. Each N.LITE modem **1005** may communicate with other N.LITE modems **1005** or with other NDSL modems, e.g. modem **605**, located in the subscriber's ~~premise~~ premises. Thus, an N.LITE **1005** may support only home data network communication.--

Kindly replace the paragraph on Page 17 that begins with the words "For home data network ...", with the following paragraph:

A43
-- For home data network communication, the N.LITE modem **1005** uses a half-duplex protocol and the information transmits in two directions of data packets, with time division

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multiplexing (TDM). The N.LITE modem **1005** communicates, in this embodiment, only within the ADSL upstream frequency band **103**. The data exchange between N.LITE modems **1005** may thus have a bit rate of up to 1.5 Mb/s. Each of the N.LITE modems **1005** may be linked to a home digital equipment such as a printer **227** or a scanner **1007**. --
